# INVESTIGATOR'S ANNUAL REPORT

**National Park Service**

**All or some of the information provided may be available to the public**

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| **Reporting Year:**<br>1993 | **Park:**<br>Shenandoah NP |
| **Principal Investigator:**<br>Owen P. Bricker | **Office Phone:**<br>703-648-5824<br>**Email:**<br>obricker@usgs.gov |
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**Additional investigators or key field assistants (first name, last name, office phone, office email):**

No co-investigators

**Permit#:**
SHEN1993AGPJ

**Park-assigned Study Id. #:**
unknown

**Project Title:**
Impact of Acid Rain on Geologically Sensitive Watersheds

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| **Permit Start Date:**<br>Jan 01, 1998 | **Permit Expiration Date**<br>Jan 01, 1998 |
| **Study Start Date:**<br>Jan 01, 1993 | **Study End Date**<br>Jan 01, 1993 |

**Study Status:**
Completed

**Activity Type:**
Other

**Subject/Discipline:**
Air Quality

**Objectives:**

To examine the impacts of acid rain on watershed processes and on the chemistry of stream water and ground water in a forested watershed on a granite terraine.

**Findings and Status:**

Water levels in the well ranged from a recorded high of 2.07 ft to a low of 21.95 ft during the period of record. It should be noted that while the recorded high was 2.07 ft, it is quite possible that this value was exceeded but not recorded due to the counter weight and the float not having room to pass freely inside the casing.;Water levels were usually at their highest during the winter and early spring months. During the period when vegetation and trees were in their budding and growing stages, a steady decrease in water levels was noted despite variable amounts of incoming precipitation. This trend would normally continue until late September or early October when levels would start to increase and the response to precipitation was more noticable. Two years which showed a variation from this trend were 1989 and 1990. A significant recharge occurred in Jan 1989 after which time water levels showed small changes as compared to previous years. In contrast, 1991 showed a steady decline in water levels with the usual winter and summer pattern reappearing in 1992.;The annual average total recorded precipitation for the period 1983 to 1991 was 44.74 inches. The lowest yearly total was 31.79 inches in 1988 while the highest total was 59.50 inches in 1983. November and May had the highest average monthly total while December and January had the lowest average monthly total.;Generally, the precipitation was fairly well distributed over the 12 month period, however, most of the precipitation during the summer months occurred as brief but intense thunderstorms. The precipitation fell as rain, snow, hail, and sleet during the period.

**For this study, were one or more specimens collected and removed from the park but not destroyed during analyses?**
No

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| **Funding provided this reporting year by NPS:**<br>0 | **Funding provided this reporting year by other sources:**<br>10000 |

**Fill out the following ONLY IF the National Park Service supported this project in this reporting year by providing money to a university or**

| college | |
|---|---|
| **Full name of college or university:** | **Annual funding provided by NPS to university or college this reporting year:** |
| n/a | 0 |